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SUGHRUE, MION, ZINN, MACPEAK & SEAS, PLLC
Suite 800
2100 Pennsylvania Avenue, N.W.
Washington, DC 20037-3213

EXAMINER	
FERRIS III, FRED O	

ART UNIT	PAPER NUMBER
2128	18

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Please find below and/or attached an Office communication concerning this application or proceeding.

DETAILED ACTION

1. This Supplemental Office Action supercedes the previous Office Action dated 2 April 2004 that contained a typographical error in the 35 USC 103(a) prior art references. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 20 February 2004 (paper # 15) has been entered. Claims 1-26 are currently pending in this application.

Response to Arguments

2. Applicants arguments filed on 20 February 2004 (paper # 15) have been fully considered.

Regarding applicant's response to 112(1) rejection: Applicant's argue that the prior art submitted in applicant's IDS filed on 2 January 2001 contains "voluminous teachings" on how components in picture data is recognized and therefor the specification need not disclose such techniques in detail. The examiner asserts that these various teachings are application specific and do not directly disclose the level of skill an artisan would require to realize the claimed invention without undue experimentation. The Watanabe 016' patent, for example, is drawn to manipulation of three-dimensional information input using a stereoscopic imaging sensor, while the Arakawa 450' patent is drawn to the display of a three-dimensional shape model of

sensor monitored plant equipment. None of the prior art cited by applicants discloses specifically how a skilled artisan would perform an image analysis to extract the required geometric information from digital picture data, nor specifically how identifying and matching the geometric information with component information is performed. (see specification: page 8, line 19-23) Applicant's arguments are completely silent on specifically how any of the techniques disclosed in the referenced prior art would be applied to the method of the claimed invention. Applicants have also not incorporated any of the referenced prior art by reference and have not clarified which elements of the claimed invention are novel over the referenced prior art. Applicant's arguments appear to be an attempt to cure the deficiencies of the specification by incorporating new matter (via argument) into the specification after the original filing date.

Regarding examiner's indication of non-enabled claim elements the MPEP 706 recites:

"UNIFORM APPLICATION OF THE PATENTABILITY STANDARD

The standards of patentability applied in the examination of claims must be the same throughout the Office. In every art, whether it be considered "complex," "newly developed," "crowded," or "competitive," all of the requirements for patentability (e.g., novelty, usefulness and unobviousness, as provided in 35 U.S.C. 101, 102, and 103) must be met before a claim is allowed. The mere fact that a claim recites in detail all of the features of an invention (i.e., is a "picture" claim) is never, in itself, justification for the allowance of such a claim.

An application should not be allowed, unless and **until issues pertinent to patentability have been raised and resolved in the course of examination and prosecution**, since otherwise the resultant patent would not justify the statutory presumption of validity (35 U.S.C. 282), nor would it "strictly adhere" to the requirements laid down by Congress in the 1952 Act as interpreted by the Supreme Court. **The standard to be applied in all cases is the "preponderance of the evidence" test**. In other words, **an examiner should reject a claim if, in view of the prior art and evidence of record, it is more likely than not that the claim is unpatentable."**

Applicants have also referenced pages 15-18 of the specification as providing the required enablement for the claimed limitations. The examiner has again reviewed these passages and respectfully disagrees. For example, specification page 18 recites that, "the evaluation-and-control-unit tries automatically or in interaction with the user to identify components in the prepared sources". This passage implies that the user, in the "or" case, and not the evaluation-and-control-unit, actually identifies the components in the prepared source. Further, the specification does not disclose how the process would "automatically" identify components in the prepared sources. In this case the specification is again unclear on how the assignment based on geometric elements is achieved, what the geometric elements actually are, and what geometric properties are actually assigned the analysis. These passages only further bolster the examiners position that the specification for the claimed invention does not provide enablement for the claimed limitations.

The specification further does not disclose, and applicant's response has not argued, specifically how the claimed method for ***deriving a hypotheses*** *for* ***identified components*** *in* ***picture data*** *is performed.*

Accordingly, the examiner maintains the 112(1) rejection.

Regarding applicant's response to 103(a) rejections: Applicant's arguments relating to perfection of the priority date are persuasive. (The examiner acknowledges the receipt of English translation of priority document, paper # 16) Accordingly, the examiner withdraws the previous 103(a) rejection using Marks in view of Asar, in further

view of Crandall as prior art. However, the examiner has now applied new 103(a) rejections. (See new 103(a) rejections below)

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1-12 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Specifically, in independent claim 1 applicant's are claiming an ***evaluation and control unit*** *for comparing component information data with real picture data but the specification does not disclose an algorithm or technique for comparing component information data with real picture data. Neither the operation of the* ***evaluation and control*** *unit, nor the process of* ***identifying components in picture data****, nor the claimed* ***deriving hypotheses****, is sufficiently described in the specification to allow one skilled in the art to make and/or use the invention.*

While page 4, line 5 of the specification state that the evaluation and control unit controls the process of generating the virtual installation model and controls an "automatic function" (page 5, line 13), it does not sufficiently describe functional operation either the process or the "automatic function". Obviously, one skilled in the art

would not be able to create an "automatic function" without specific details on how the automatic function operates. Merely stating that the evaluation and control unit "processes component data" (page 8, line 8) and "performs image analysis" (page 8, line 20) does not provide a sufficient description to allow one skilled in the art to make and/or use the invention. Dependent claims inherit these defects.

Claims 13-26 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for "generating picture data" and "storage to store", does not reasonably provide enablement for "comparing picture data** to **identify installation components" (claim 13) or "a processing unit to compare components". The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

*Specifically, independent claim 13 claims **comparing picture data** to **identify installation components** within the picture data but again the specification does not disclose an algorithm or technique for performing the comparison or identifying the components.*

*Independent claim 25 claims a **processing unit to compare components** but does not disclose the process for comparing components sufficient to allow one skilled in the art to make and/or use the invention.*

Dependent claims inherit these defects.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. ***Claims 1-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,025,847 issued to Marks in view of U.S. Patent 5,640,468 issued to Hsu in further view of U.S. Patent 5,552,984 issued to Crandall et al.***

While the specification for the claimed invention is delinquent in the areas cited above (see 112(1) rejections), the examiner has made prior art rejections based on the limited scope of the information contained in the specification.

Independent claim 1 is drawn to:

Generating an **image of installation model** by:
Memory (1st) for storing **picture data**
Memory (2nd) for storing **component information**
Memory (3rd) for storing **virtual installation model**
Evaluation and control unit for comparing component information data with real picture data
Identifying components in **picture data** as **installation components**

Deriving a hypotheses for **identified components** in **picture data**
Generating respective **installation components** in **virtual installation model**

*Regarding independent claim 1: Marks teaches a system and method of generating a 3D **(virtual) model** from an **image (picture)** using a computer system. The image is of an arrangement of physical objects (components) where primitives (geometric) representing a portion of a physical object (a component) in the image are specified as a set of parameters that correspond locations in the **image model**. Marks further discloses incorporating a **memory space** for storing picture data, component (object) information. (Abstract, Summary of Invention, Figs. 1-7, CL3-L2-10, CL4-L45, CL7-L35-67, CL7-L5-50)*

Marks does not explicitly teach comparing component information data with real picture data.

*Hu teaches a system and method for identifying components by **comparing component information data** (from a knowledge base) with **real picture data** and incorporating multiple memories for storing picture data and component information. Hu further discloses evaluating (deriving a hypotheses via the image system) identified components (objects) in the picture data. (Abstract, Summary of Invention, Figs. 1-4, 6, 8a-10b, CL13-L15-CL14-55)*

Hu mentions, but further does not explicitly teach virtual components (installation).

*Crandall teaches generating a **virtual model** of a **real system** using **virtual components** (installation components) from a library of components representing the*

*total **virtual system** (installation). (Abstract, Summary of Invention, Figs. 1a&b, 9, CL2-L5-11, CL4-L1-29)*

*It would have obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Marks relating to a system and method for generating a 3D **(virtual) model** from an **image (picture)**, with the teachings of Hu relating to identifying components by **comparing component information data** with **real picture data** from a knowledge base, and to further modify the teachings of Marks with the teachings of Crandall relating to generating a **virtual model** of a **real system** using **virtual components** (installation components) from a library of components representing the total **virtual system** (installation), to realize a device and method for generating a virtual model of an installation. An obvious motivation exists since, as referenced by prior art, creating a 3D (virtual) model of physical objects provides more efficient detection of discrepancies between the model and the actual image. (See Marks Background)*

*Regarding dependent claims 2-4: Hu performs image analysis on picture data as previously cited above. Crandall teaches using **virtual components** (installation components) from a library of components representing the total **virtual system** (installation) (CL2-L5-11). Marks teaches objects being located by geometric information and multiple window views of picture data and 3D (virtual) model views. (CL4-L10-25, Figs. 2-7)*

Regarding dependent claims 5-9: Marks discloses building a 3D (virtual) model using the well-known techniques of "dropping", "clicking and dragging", and "rubber

banding" in the manipulation of primitives based on geometric information (CL4-L42). Marks also teaches the evaluation of structural components (by function) to assign primitives (add components) in a 3d (virtual) installation model. (Figs. 9-25, CL3-L29-43, CL5-L12-25, CL6-L10-35)

Regarding dependent claims 10-12: Marks teaches the "automatic" component location (CL7-42) and a system incorporating a digital camera, digitized photographs (picture data), and a CAD system with memory and a multiple perspective view display. (Abstract, Summary of Invention, Figs. 1-7, CL3-L2-10, CL4-L45, CL7-L35-67, CL7-L5-50)

Independent claim 13 is drawn to:

Generating an **image of real installation model** by:
Generating **picture data**
comparing component information data with picture data
Identifying components in **picture data** as **installation components**

*Regarding independent claim 13: As previously cited, Marks teaches a system and method of generating a 3D **(virtual) model** from an **image (picture)** using a computer system. The image is of an arrangement of physical objects (components) where primitives (geometric) representing a portion of a physical object (a component) in the image are specified as a set of parameters that correspond locations in the **image model**. (Abstract, Summary of Invention, Figs. 1-7, CL3-L2-10, CL4-L45, CL7-L35-67, CL7-L5-50)*

Marks does not explicitly teach comparing component information data with real picture data.

Hu teaches a system and method for identifying components by ***comparing component information data*** *(from a knowledge base) with* ***real picture data*** *and incorporating multiple memories for storing picture data and component information. Hu further discloses evaluating (deriving a hypotheses via the image system) identified components (objects) in the picture data. (Abstract, Summary of Invention, Figs. 1-4, 6, 8a-10b, CL13-L15-CL14-55)*

Marks mentions, but further does not explicitly teach virtual components (installation).

Crandall teaches generating a ***virtual model*** *of a* ***real system*** *using* ***virtual components*** *(installation components) from a* ***library of components*** *representing the total* ***virtual system*** *(installation). (Abstract, Summary of Invention, Figs. 1a&b, 9, CL2-L5-11, CL4-L1-29)*

It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Marks relating to a system and method for generating a 3D ***(virtual) model*** *from an* ***image (picture)****, with the teachings of Hu relating to identifying components by* ***comparing component information data*** *(from a knowledge base) with* ***real picture data****, and to further modify the teachings of Marks with the teachings of Crandall relating to generating a* ***virtual model*** *of a* ***real system*** *using* ***virtual components*** *(installation components) from a library of components representing the total* ***virtual system*** *(installation), to realize a*

device and method for generating a virtual model of an installation. An obvious motivation exists since, as referenced by prior art, creating a 3D (virtual) model of physical objects provides more efficient detection of discrepancies between the model and the actual image. (See Marks Background)

Regarding dependent claims 14-16: As also previously cited, Hu teaches image analysis on picture data as previously cited above. Crandall teaches using ***virtual components*** *(installation components) from a* ***library of components*** *representing the total* ***virtual system*** *(installation) (CL2-L5-11) Marks teaches the manipulation of primitives based on geometric information (CL4-L42) and multiple window views of picture data and 3D (virtual) model views. (CL4-L10-25, Figs. 2-7).*

Regarding dependent claims 17-24: Marks discloses building a 3D (virtual) model using the well-known techniques of "dropping", "clicking and dragging", and "rubber banding" in the manipulation (matching) of primitives based on ***geometric information*** *(CL4-L42). Marks also teaches the* ***evaluation*** *of structural components (by function) to assign primitives (add components) in a 3d (virtual) installation model. (Figs. 9-25, CL3-L29-43, CL5-L12-25, CL6-L10-35) It further would have been obvious, and necessary, to "select" and "drag" installation components since all modern GUI based CAD system operate in this manner. Marks further teaches "automatic" component location (CL7-42) and a system incorporating a digital camera, digitized photographs (picture data), and a CAD system with memory and a multiple perspective view display. (Abstract, Summary of Invention, Figs. 1-7, CL3-L2-10, CL4-L45, CL7-L35-67, CL7-L5-50)*

Regarding claims 25 and 26: Claims 25 and 26 merely claim the virtual model of a facility that includes the same limitations as disclosed in claims 1-24. Claims 25 and 26 are therefore rejected using the same reasoning as previously cited above.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure, careful consideration should be given prior to applicant's response to this Office Action.

U.S. Patent 5,988,862 issued Kacyra et al teaches component modeling from picture data.

U.S. Patent 5,894,310 issued to Arsenault et al teaches virtual modeling of systems.

U.S. Patent 5,812,394 issued to Lewis et al teaches virtual components and installation.

U.S. Patent 4,937,768 issued to Carver et al teaches virtual system modeling.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fred Ferris whose telephone number is 703-305-9670 and whose normal working hours are 8:30am to 5:00pm Monday to Friday.

Any inquiry of a general nature relating to the status of this application should be directed to the group receptionist whose telephone number is 703-305-3900.

The Official Fax Numbers are:

Official (703) 872-9306

Fred Ferris, Patent Examiner
Simulation and Emulation, Art Unit 2128
U.S. Patent and Trademark Office

Crystal Park 2, Room 2A22
Crystal City, Virginia 22202
Phone: (703) 305 - 9670
FAX: (703) 305 - 7240
Fred.Ferris@uspto.gov

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